PIAT DEVELOPMENT TOWARDS WELLNESS TOURISM WITH KANSEI ENGINEERING AND KANO MODELS

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Abstract

Wellness tourism is one of the efforts to revive the Indonesian tourism sector during the transition period of the pandemic to endemic. People seek prevention and health maintenance by traveling to get a better quality of life. Giving rise to wellness tourism as wellness and health tourism in the form of health care based on a healthy natural environment and restoration of relaxation. One of the innovations carried out by PIAT is the development of agro-industry by applying the concept of wellness tourism. Tourist attractions will be more valuable if they can meet the needs of the highest level, namely pleasure. This study aims to: (1) identify the words Kansei of prospective tourists related to wellness tourism. (2) determine the concept model of wellness tourism atmosphere design that suits the pleasure needs of tourists. (3) improve the products and services of the Agrotechnology Innovation Center (PIAT) based on the priority attribute of tourist needs.

This research used the Kansei engineering method and the kano model. Semantic Differential (SD) Questionnaire 1 to capture images of wellness attractions. Kansei engineering begins with the collection of tourist pleasure needs in the form of Kansei word, simplifying Kansei word with factor analysis, categorization analysis of Kano models, identification of technical attributes, dissemination of SD 2 questionnaires and questionnaire analysis with quantification theory 1 (QT1) to determine the correlation between tourist attributes and design concepts quantitatively. The results obtained from the first questionnaire, there are nine Kansei words that describe wellness tourism places at PIAT UGM, namely "Worthy-Shady", "Quite Adequate-Good", "Warm-Cool", "Spread-Neat", "Somber-Fun", "Set-Customized", "General-Local Wisdom", "Independent-Existence of Guides", and "Vintage-Latest (Update)". The order of priority of improvement is based on the attraction & one attribute. In addition, this study produced five concepts of wellness tourism service design atmosphere that suit the pleasure needs of tourists, namely: "cool", "local wisdom", "fun", "the presence of a guide", and "good". The results showed that all service design concepts have an R-value of more than 0.8 so all concepts are used in determining service design prototypes.

1. Introduction

Facing the decline in the tourism industry related to the obstruction of the development of other sectors and paying attention to the running of the workforce participating in tourism activities, the country began to reopen tourism activities but still with the adjustment of new normal health protocols in the field of tourism industry & business. This is a consideration for tourists during tourist trips about worrying about being infected with the virus. This pandemic has changed the character of tourists in choosing the purchase tourism products and services. Tourists want peace in tourism, namely ensuring a cool environment, wellness, and safety from Covid-19 infection (Suprihatin, 2020). The transition factor of the pandemic to endemic in Indonesia is influenced by several aspects, one of which is the health aspect. People are beginning to understand the importance of maintaining body wellness, so this has become the concept of health and wellness programs as a movement to maintain immune stability for the transition from pandemic to endemic.

As an effort to support the growth of wellness tourism development in the post-pandemic era the G20 Presidency with the spirit of "Recover together, recover stronger" is a reference for the focus of the recovery of the tourism sector. Research in the field of tourism and the field of service industry has been carried out by several previous researchers. Reference Pratiwi et al. (2021), who conducts research analysis in the tourism industry in Central Java. This study aims to find out how to increase the resilience of tourism destinations through service innovation creativity to regain public trust during the Covid-19 pandemic. The application of the wellness tourism design is used as one of the steps provided by tourist destinations in developing countries, for example when an area or tourism area integrates the concept of tourism presentation with the conception of "rest" and helps health services during recreational trips that have an impact on visitors' sense of security and confidence in the existence of health and culinary services that have an immune-boosting function.

Efforts to support wellness as the highest need of tourists and the most precise due to the shifting of the pandemic era to endemic use the theory of the emotional needs of tourists. A tourist product is expected to meet the needs of tourists physically and emotionally. Consumer needs consist of many levels ranging from functional needs (functionality), usability (usability), and comfort (pleasurability) (Jordan, 2000). The highest level is comfort, namely the ability of the product to provide psychological comfort for the user. The focus of this study was carried out to identify the comfort needs (pleasure) of prospective tourism from PIAT wellness tourism respondents. These psychological and physiological comfort needs are known as Kansei, one method of developing products and services using the consumer pleasure needs approach is Kansei engineering.

In addition to Kansei engineering, the Kano model can also be used to relate to tourist needs and identify technical requirements. The level of customer satisfaction can be influenced by various factors and is not always in a positive linear form because not all service attributes provided will

have a balanced and significant effect on customer satisfaction. The Kano model plays an important role in categorizing the performance of a service and prioritizing service gaps to determine service attributes that require more attention, in this case, the Kano model is used to determine the level of a hierarchy of consumer needs and satisfaction (Hsiao et al., 2017).

These two methods can complement each other between the interests and priorities of design elements and attributes in increasing customer satisfaction. The combination of the two methods is used to interpret consumer perceptions into Kansei words and translated into design elements and then categorized into Kano model attributes (Tama et al., 2015). The analytical methods used in this study are Factor analysis (FA) and Quantification Theory Type 1 (QT1). In addition, the Kano model analysis method is used to categorize 3 types of service attribute levels, namely Attractive (A), One-Dimensional (O), and Must-Be (M) as well as consumer responses such as Indifferent (I), Reverse (R), and Questionable (Q) to know the classification of service attributes which are the output concepts in tourism development.

2. Methodology

This research uses a case study approach, namely the Center for Agrotechnology Innovation (PIAT) UGM. The output of this study is the design of wellness tourism services based on products and services at PIAT UGM. The integration of the two Kansei engineering methods with the Kano model has several stages. Based on preliminary observations, a Bill of Materials was obtained from PIAT UGM which is a means of science and technology services for the community, integrated agriculture conservation, sustainable environmental education, and preservation of Indonesian medicinal diversity that combines economic, social, cultural, and sustainable aspects of the environment. From the services and facilities above, it is designed to be a wellness tour with a Bill of materials (BoM) items that make up the tour and the results of tourist preferences. The BoM is created as part of the service design process and then used to determine what services and products should be implemented.
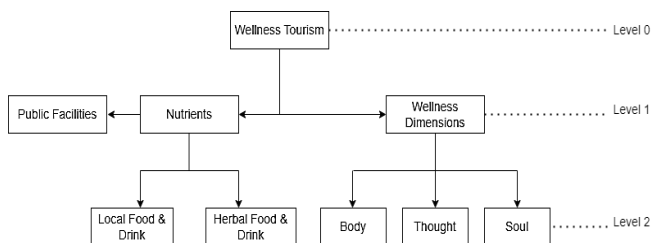

Figure 1. BoM Tree Wellness Tourism Product at PIAT

The initial stage of the research methodology is collecting data to support the development of PIAT toward wellness tourism. Data were collected by observing, interviewing, and filling out questionnaires by respondents and the PIAT manager as expert judgment. Direct interviews and open interview questionnaires were used to identify the service attributes desired by respondents using the Kansei engineering concept. Then the desired service attributes in

the development of PIAT are translated into Kansei words. The Kansei word criteria used are those that can describe the psychology that respondents want to feel when traveling on wellness tours.

a. Sampling

Determination of the sample for this study is important because it is not possible to make the entire population respondents in the next questionnaire. The target population in this study is the Indonesian people with an affordable population of productive age. Respondents were taken from the affordable population by meeting the following criteria:
1) Respondents aged between 17-64 years
2) Respondents have or are currently doing School from Home (SFH) or Work from Home (WFH)
3) Traveling in the last two years

After obtaining the Kansei word for wellness tourism, the main questionnaire was compiled in the form of a semantic differential (SD). The number of samples used in this SD questionnaire was determined by the Lemeshow formula approach because the population is unknown (Lemeshow, 1997).

$$ n = \frac{Z^2 \times p(1-p)}{d^2} \qquad (1) $$

Information:
n = number of samples
Z^2 = Z score at 95% level
$p = maximum\ estimation$
d = precision

Calculation of the number of respondents using the Lemeshow method with a 95% confidence level resulted in 100 respondents. The number of respondents increased by about 10%, bringing the total to 106 minimum respondents. Data was collected through five times the distribution of questionnaires. Data was collected through five times the distribution of questionnaires. The first questionnaire is an open interview with 45 respondents, the second questionnaire is content validity to 6 respondents as panelists. The third questionnaire is the main questionnaire which was distributed to the initial 30 respondents for construct validity, then if it is valid and reliable, it continued to be distributed again with a total of 146 respondents who will be factor analyzed. The fourth questionnaire is the Kano model which was distributed to 134 respondents. The fifth questionnaire is semantic differential 2 (SD 2) to 162 respondents.

b. Kansei Engineering
The following are the stages in using Kansei engineering
1) The determination of pairs of Kansei words collected from open interviews will be searched for opposites to provide semantic space for each word.
2) Making the SD 1 questionnaire, the pair of Kansei words obtained from the results of an open interview then carried out a content validity process to see how feasible it is to reveal the attributes to be measured that are relevant to the development of wellness tourism.

Before the content validity test, questionnaires were distributed to 6 respondents as panelists and then the data was analyzed using Aiken's formula (Aryanto et al., 2018).

$$V = \sum S/[n(C-1)]$$ (2)

Where:
V = Index of respondent agreement
S = The score assigned by each respondent minus the lowest score in the category
Lo = lowest rating score
C = highest rating score
R = number given by the rater

3) Distribution of the SD 1 questionnaire, to test the validity and reliability of the SD 1 questionnaire, will be tested first to 30 initial respondents to carry out construct validity as a measurement in decision making whether the questionnaire has been able to reveal a trait to be measured (Sugiyono, 2009).
4) Test the validity and reliability by testing the questionnaire on the respondents and passing the valid and reliable test using SPSS version 24 with Pearson product-moment correlation coefficient analysis. with the following formula in the book (Umar, 1998) shown in formula 3 as follows:

$$r_{xy} = \frac{n.\sum x.y - (\sum x)(\sum x)}{\sqrt{[n.\sum x^2 - (\sum x^2)]\,[n.\sum y^2 - (\sum y^2)]}}$$ (3)

Information:
r_{xy} : Pearson correlation coefficient between the instrument items to be used and the variable in questioner
x = The score of the instrument item to be used
y = Scores of all instrument items in the variabel
n = Number of respondents

The reliability test was conducted to determine whether the research instrument in the questionnaire used was Quite Adequate and reliable to be used as a data collection tool. The reliability test is using the Cronbach Alpha formula shown as follows:

$$r_i = \frac{k}{(k-1)}\left\{1 - \frac{\sum s_i^2}{s_t^2}\right\}$$ (4)

Information:
r_i = Alpha Cronbach's reliability coefficient
k = Number of question items
$\sum s_i^2$ = Total score variance on each item
s_t^2 = Total variance

5) In factor analysis, Kansei words were evaluated through a semantic differential and then analyzed using the Kaiser Mayer Oikin (KMO) Measure of Sampling Adequacy statistical factor analysis method with a comparison index of the distance between correlations with their partial coefficients. This KMO test aims to

determine whether the data taken is Quite Adequate to be factored in. If the KMO value is greater than 0.5 then the amount of factored data is accepted so that the amount of data has been factored enough.

c. Kano Models
1) In the design of the Kano model questionnaire, customer needs have been identified in the process of determining the Kansei word so that in this process it is directly entered into the design preparation.
2) Evaluation of the Kano model questionnaire, the Kano questionnaire was designed using a Likert scale presented with statements related to the attributes obtained in the previous questionnaire. Respondents were asked to assess the statements given, namely functional and dysfunctional.
3) Test the validity and reliability of the Kano model to calculate the r^2 determination. If it is not valid, then the Kano model category is grouped again.
4) Testing the Kano model to find out how well the attributes are in tourist satisfaction, so categorization is needed. The output of this categorization is to find out which attributes will be held in the preparation of the design of wellness tourism services. To find out whether these attributes are following the wishes of tourists, an evaluation is carried out using the Kano model evaluation table.

Table 1. Kano Model Evaluation

Tourist Needs		Dysfunctional				
		Like	Expect	Neutral	Tolerance	Do not like
Functional	Like	Q	A	A	A	O
	Expect	R	I	I	I	M
	Neutral	R	I	I	I	M
	Tolerance	R	I	I	I	M
	Do not like	R	R	R	R	Q

5) Better-worse analysis, after calculating using the Kano model evaluation table, the value for each category is obtained. The results of the KANO evaluation should be analyzed using the better-worse or if-then method (Wijaya, 2011), here the researcher uses better-worse to get a more comprehensive view.

$$Better = \frac{A+O}{A+O+M+I}$$ (5)

$$Worse = -\frac{O+M}{A+O+M+I}$$ (6)

Where:
A = Attractive
O = One Dimensional
M = Must-be
I = Indifferent

6) Ordering service priorities, to know the order of service development priorities, is carried out by determining

the importance of attribute quality using the Average Satisfaction Coefficient (ASC) for each line of use cases. The ASC formula can be calculated with the average coefficient of tourist satisfaction (Better) and the coefficient of tourist dissatisfaction (worse) with the values of the variables already known in the previous tabulation.

$$ASC = \frac{|Better| + |Worse|}{2} \qquad (7)$$

d. Kansei Engineering

1) Selection of 10 samples of products, services, and agro-tourism facilities at PIAT Mangunan, both natural and artificial, which have the potential to be developed for wellness tourism. Determination of the sample based on interview data from the PIAT manager was then discussed together to decide on an approved sample. The selected object is intended to accompany all possible wellness dimensions available at PIAT UGM.

2) Determination of the technical attributes of wellness tourism along with the level of attributes that will be used to compile the design of tourism products.

3) The determination of these technical attributes involves discussions with the UGM PIAT management. The service design uses an orthogonal design to simplify the number of designs that will be assessed by respondents.

4) Analysis of Quantification Theory Type 1 (QT 1). Example for a book on (Nagamachi, 2011) QT1 quantification theory is a method used to analyze the relationship between Kansei words and wellness tourism design elements, in this case, the element design is a predetermined item.

3. Results & Discussion

This research was conducted by the Center for Agrotechnology Innovation (PIAT) UGM as a case study on the validation of the concept of an innovation strategy for the development of Agriculture-based Wellness Tourism. PIAT is an innovation center and an integrated agro-tourism area that involves food and beverage MSMEs through an innovation strategy approach to support post-pandemic economic recovery, especially in the Special Region of Yogyakarta, through agricultural-based wellness tourism technology.

The services offered by PIAT are educational visits (school age, students, and the public), internships/PKL for vocational/high school students and university students, practicum for students, and utilization of Edugarden for outbound and camping activities. The potential sub-sectors are food crop agriculture and horticulture; animal husbandry and health; biopharmaceutical.

Since 2021, the post-harvest and marketing sub-sectors have begun to eliminate food and beverage products that are less attractive to consumers and only focus on making processed food and beverage products that have good selling performance, namely: processed food products; beverage processed products; herbal drinks.

a. Kansei Word Collection

The initial stage to identify the word Kansei in this study is to conduct open interviews involving 45 respondents to generate the word Kansei in wellness tourism. The respondents here are PIAT management experts and potential tourists. The word Kansei is used as an example of a journal article in this article (Kuo et al., 2014) namely taking attributes from interviews with experts in their fields. Based on the results of the open interview questionnaire and literature study, 64 Kansei words were obtained as initial observations. All Kansei words were then selected subjectively by considering the similarity of meaning to one another so 39 Kansei words were selected.

b. Evaluation of Content Validity

Before the Kansei word pair is used to reveal the content or content in wellness tourism, a content validity questionnaire with 3 scales is made. A value of "1" means that it is not relevant to the content or content, a value of "2" means that it is quite relevant to the content or content, and a value of "3" is very relevant to the content or content. This questionnaire contains 39 pairs of Kansei words which will be distributed to 6 respondents as competent raters or expert judgments in the field of wellness tourism development and PIAT managers. The results of this calculation and analysis will be concluded in the form of validity categorization. The categorization of content validity refers to Aiken's table. Aiken's table value of 6 respondents and 3 scales is 0.83, so the value of ≥0.83 is considered valid. The following Table 4.3 is the result of Aiken's validity test from the content validity evaluation questionnaire with 20 pairs of valid Kansei words.

Table 2. Validity Test with Aiken's Formula

No.	Kansei Word Pair	V	Validity
1	Ordinary - Beautiful	1	High
2	Tense- Comfortable	1	High
3	Delicious- Healthy	0.917	High
4	Monotone- Creative	0.833	High
5	Ordinary-Clean	0.917	High
6	Worthy- Shady	0.917	High
7	Independent- Existence of Guides	0.917	High
8	*Vintage-Latest (Update)*	0.917	High
9	Quite Adequate-Good	0.917	High
10	Warm-Cool	0.917	High
11	Quiet-Busy	1	High
12	Set-Customized	0.833	High
13	Worth-Informative	0.833	High
14	Premium-Cheap	0.917	High
15	Cultural Tourism-Nature Tourism	1	High
16	Ordinary-Professional	0.917	High
17	General-Local Wisdom	0.917	High
18	Change-Sustainable	0.917	High
19	Spread-Neat	0.917	High
20	Somber-Fun	1	High

c. Semantic Differential Evaluation 1

Before proceeding to the next stage, namely the distribution of the SD I questionnaire, the 20 pairs of Kansei words were carried out by construct validity analysis which was tested on 30 initial respondents who knew PIAT and met the three criteria to ensure the questionnaire was able to reveal the construction of a concept to be measured. Furthermore, the questionnaire was analyzed for construct validity, namely validity and reliability tests with the help of SPSS 24.

Table 3. Kansei Word Pair Validity Test

Instrument Items	Pearson Correlation r_{xy}	r_{table}	Value Significance	Validity Status
Ordinary - Beautiful	0.077	0.361	0.687	Invalid
Tense- Comfortable	0.133	0.361	0.483	Invalid
Delicious- Healthy	0.644	0.361	0	Valid
Monotone- Creative	0.307	0.361	0.099	Invalid
Ordinary- Clean	0.08	0.361	0.674	Invalid
Worthy- Shady	0.38	0.361	0.038	Valid
Independent- Existence of Guides	0.575	0.361	0.001	Valid
Vintage-Latest (Update)	0.621	0.361	0	Valid
Quite Adequate- Good	0.66	0.361	0	Valid
Warm-Cool	0.619	0.361	0	Valid
Quiet-Busy	0.324	0.361	0.081	Invalid
Set- Customized	0.553	0.361	0.002	Valid
Worth- Informative	0.215	0.361	0.253	Invalid
Premium- Cheap	0.122	0.361	0.521	Invalid
Cultural Tourism- Nature Tourism	0.167	0.361	0.379	Invalid
Ordinary- Professional	0.492	0.361	0.006	Valid
General-Local Wisdom	0.525	0.361	0.003	Valid
Change- Sustainable	0.034	0.361	0.86	Invalid
Spread-Neat	0.516	0.361	0.003	Valid
Somber-Fun	0.39	0.361	0.033	Valid

Pairs of valid Kansei words were then discussed with representatives of the PIAT management to review the extent to which they were able to measure aggressiveness in the form of behavior and the framework of a PIAT development concept and the 11 selected Kansei words were able to explain the concept of wellness tourism.

The selected pair of Kansei words were then further analyzed using a reliability test and showed a positive r-alpha value of 0.788. According to Hair (1995) in a journal article in Chen et al. (2015), argues that the lower limit value to be said to be reliable is 0.7 so in this study, it can be said that with 11 pairs of Kansei words it is reliable and ready to be tested on general respondents to the next stage. The eleven pairs of Kansei words can be shown in Table 4 below. The results of the validity and reliability tests are in Table.

Table 4. Valid And Reliable Kansei Word Pairs

No	Kansei Word Pairs
1	Delicious- Healthy
2	Worthy- Shady
3	Independent- Existence of Guides
4	Vintage-Latest (Update)
5	Quite Adequate-Good
6	Warm-Cool
7	Set-Customized
8	Ordinary-Professional
9	General-Local Wisdom
10	Spread-Neat
11	Somber-Fun

d. Factor Analysis

The results of the SD I questionnaire were then carried out by factor analysis to eliminate Kansei words that have similar meanings so that the results obtained from this test are a description of the words from the PIAT development design towards wellness tourism as expected by potential tourists. SD I questionnaires were distributed to 146 respondents throughout Indonesia who met the criteria. The results of the Kansei word factor analysis use the help of SPSS 24 software. From the results of the factor analysis, a total of 9 adjectives are grouped into 3 factors. Table 5 presents the elements that make up the factors and their correlations. Cronbach alpha on each factor varies from 0.05 to 0.851 which indicates that the value is within the range that meets the reliability requirements(Streiner, 2003).

Table 5. Loading Factor Value Pairing Kansei Word with Established Factors

Factor	Eigen Value	Kansei Word	Loading Factor
1	3.250	Worthy- Shady	0.621
		Quite Adequate-Good	0.712
		Warm-Cool	0.727
		Spread-Neat	0.505
		Somber-Fun	0.531
2	1.310	Set-Customized	0.625
		General-Local Wisdom	0.770
3	1.060	Independent- Existence of Guides	0.717
		Vintage-Latest (Update)	0.851

e. Kano Models
1) Validity Test

Respondents used as many as 134 people, then 134-2 = 132 seen in table r which is 0.1697. If r count r table (two-sided test with sig. 0.05). Then the instrument or the 18 questions items significantly correlated to the total score (declared valid).

Table 6. Kano Model Validity Test

Instrument Items	Pearson Correlation r_{xy}	r_{table}	Value Significance	Validity Status
Shady	0.434	0.1697	0.000	Valid
Worthy	0.288	0.1697	0.001	Valid
Good	0.396	0.1697	0.000	Valid
Quite Adequate	0.257	0.1697	0.003	Valid
Cool	0.523	0.1697	0.000	Valid
Warm	0.573	0.1697	0.038	Valid
Neat	0.356	0.1697	0.000	Valid
Spread	0.253	0.1697	0.003	Valid
Fun	0.654	0.1697	0.000	Valid
Somber	0.436	0.1697	0.000	Valid
Customized	0.663	0.1697	0.000	Valid
Set	0.497	0.1697	0.000	Valid
Local Wisdom	0.612	0.1697	0.000	Valid
General	0.388	0.1697	0.000	Valid
Existence of Guides	0.368	0.1697	0.000	Valid
Independent	0.283	0.1697	0.001	Valid
Latest (Update)	0.698	0.1697	0.000	Valid
Vintage	0.378	0.1697	0.000	Valid

2) Reliability Test

Based on the output table obtained based on the number of respondents or specimens (N) analyzed using SPSS, the number of N is 134. Because there is no blank data or in the sense that the respondent's answer has been filled in all, the valid amount value is 100%

Table 7. Reliability with 134 Data

Case Processing Summary			
		N	%
Cases	Valid	134	100.0
	Excluded[a]	0	0.0
	Total	134	100.0
a. Listwise deletion based on all variabels in the procedure.			

Table 8. Reliability of 18 Kansei Word

Reliability Statistics	
Cronbach's Alpha	N of Items
0.705	18

The table above shows the number of items or questions or N, which is 18, and Cronbach's Alpha value is 0.705. Because the results obtained by Cronbach's Alpha 0.705 > 0.700, according to Hair (1995) argues that the lower limit value of 0.7 is said to be reliable, it can be concluded that the 18 question items of the questionnaire for data variables are reliable or consistent.

3) Kano Models Testing

Table 9. Attribute Classification of Every Tourist's Needs

Tourist Needs	A	M	O	R	Q	I	Total	Category
Attribute 1	21	37	23	12	21	20	134	M
Attribute 2	19	26	36	8	23	22	134	O
Attribute 3	54	2	2	4	40	32	134	A
Attribute 4	20	43	38	3	7	23	134	M
Attribute 5	46	3	12	6	36	31	134	A
Attribute 6	36	1	4	8	35	50	134	I
Attribute 7	59	5	1	11	15	43	134	A
Attribute 8	44	11	14	21	15	29	134	A
Attribute 9	41	3	3	7	36	44	134	I

4) Better-Worse Analysis

The results of the KANO evaluation must be analyzed using the better-worse or if-then method, in addition, the results of a better-worse analysis are that the data is more concise without losing accuracy and provides more accurate results. The calculation formula is as follows:

Table 10. Tourist Satisfaction and Disappointment Level

Tourist Needs	*Better* (SI)	*Worse* (DI)
Attribute 1	0.44	-0.59
Attribute 2	0.53	-0.60
Attribute 3	0.62	-0.04
Attribute 4	0.47	-0.65
Attribute 5	0.63	-0.16
Attribute 6	0.44	-0.05
Attribute 7	0.56	-0.06
Attribute 8	0.59	-0.26
Attribute 9	0.48	-0.07

Table 11. ASC Value on Every Tourist's Need

Tourist Needs	*Better* (SI)	*Worse* (DI)	ASC
Attribute 1	0.44	-0.59	0.08
Attribute 2	0.53	-0.60	0.03
Attribute 3	0.62	-0.04	0.29
Attribute 4	0.47	-0.65	0.09
Attribute 5	0.63	-0.16	0.23
Attribute 6	0.44	-0.05	0.19
Attribute 7	0.56	-0.06	0.25
Attribute 8	0.59	-0.26	0.17
Attribute 9	0.48	-0.07	0.21

The results of the calculation of the better worse and ASC scores, the classification of 9 significant service attributes is carried out using the help of SPSS 24 software through a scatter plot diagram. For more details on the results of the analysis of the Kano model, the following diagram is presented that determines the 4 categories of Canoeing on the attributes of wellness tourism services that have been significant.
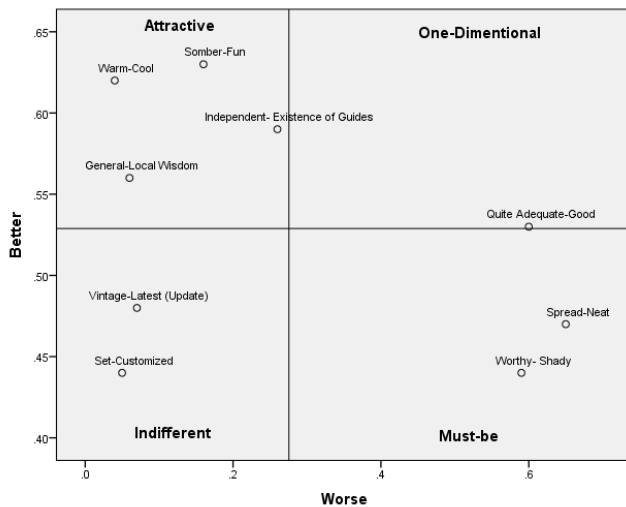

Figure 2. Scatter Diagram of the Needs Tourist Kano Model

Furthermore, the service attributes in the must-be and indifferent categories are not the focus of improvement because they do not affect the level of tourist satisfaction with wellness tourism services.

Table 12. Combination Of Service Attribute Satisfaction Scores by Kano Categories.

Categories Kano Models	Code	Service Attributes	Satisfaction Score	Decision
Attractive	Attribute 3	Warm – Cool	0.62	Fixed
	Attribute 7	General – Local Wisdom	0.56	Fixed
	Attribute 5	Somber – Fun	0.63	Fixed
	Attribute 8	Mandiri – There is a Guide	0.59	Fixed
One Dimensional	Attribute 2	Quite Adequate – Good	0.53	Fixed
Must-be	Attribute 4	Spread - Neat	0.47	No need for repairs
	Attribute 1	Worth - Shady	0.44	No need for repairs
Indifferent	Attribute 6	Set - Customized	0.44	No need for repairs
	Attribute 9	*Vintage* – Latest(*update*)	0.48	No need for repairs

f. Kansei Engineering

1) Sample Selection of Products, Services, and Facilities The selection of samples of tourism products, services, and facilities is carried out by looking at the existing potential of PIAT UGM Agrotourism service and facilities destinations. In the application of the concept of agriculture-based wellness tourism, namely the formulation of an innovation strategy in making a business plan for the development of service facilities that focus on agro-tourism and proposals from the results of the questionnaire. The number of samples used in this study is 10 which will be tested on 5 Kansei words in semantic differential

Table 13. Samples Used on Piat Products and Services

No	Sample Services & Facilities
1	Fruit picking tour Environmentally friendly plantations (3S Gardens)
2	Educational visit to agricultural areas (Biopharmaceuticals)
3	View of PIAT Magir/plateau (nature tour)
4	Dagger crafts, gamelan
5	*Café & showcase*
6	Access track road (cycling/ *fun bike*)
7	Rest area/gazebo
8	Eucalyptus essential oil making (usually takes place in June-October), (Morning to evening leaf picking, evening to morning oil distillation process) aromatherapy
9	Utilization of medicinal plants into herbal powder drinks (Cooperation with KWT Mahkota Daun), education

No	Sample Services & Facilities
10	Processed food products, beverages, and herbal drinks (culinary healthy food & souvenirs), Lethek noodle food, wedhang uwuh (regional specialty)

2) Determination of the Technical Attributes of Wellness Tourism

Determination of technical attributes involves discussions with Mrs. Lilies Setyowati, SP, M.Sc. as the manager of PIAT UGM. Then adjust to the definition of Wellness Tourism according to Mueller & Kaufmann (2001) in a journal article in (Huijbens, 2011) There are 4 factors to consider for wellness tourism, namely body wellness/beauty treatment, mind/mental education activities, relaxation, and healthy nutrition.

Based on the results of discussions with the PIAT manager, the PIAT manager chose the technical attributes used in the research, namely physical wellness, mind, soul, and nutrition by considering the existing service samples and facilities. In addition, technical attributes are added to the attributes of the physical condition of PIAT Mangunan-Girirejo which allows it to be changed to meet the comfort criteria in design imaging. The attributes of this physical condition are the Rest area (toilet, prayer room/place of worship, and temporary rest area) and Café.

Table 14. Technical Attributes of Piat Wellness Tourism

No	Attribute		Attribute Level
1	Body	1	Hiking
		2	Cycling/*fun bike*
2	Thought	1	3S fruit picking tour
		2	Educational tours of biopharmaceutical gardens
3	Soul	1	Essential oil manufacturing
		2	Herbal drink making

No	Attribute		Attribute Level
		3	Dagger crafts & gamelan
4	Nutrients	1	Herbal Food & Drinks
		2	Local Food & Drinks
5	*Rest area*	1	Inside
		2	Outside
6	*Cafe*	1	Open
		2	Closed

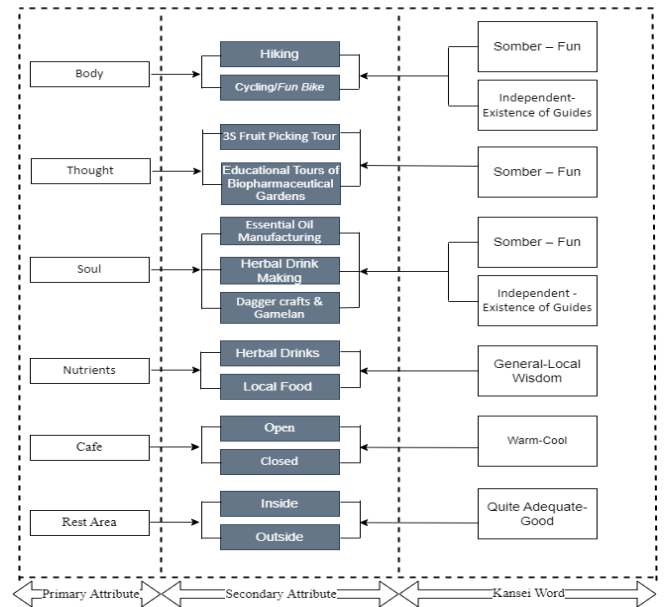Figure 3. Primary Quality Attributes Become Secondary with the Kansei Word Tree

3) Service Design Plan with Orthogonal Design

The questionnaire with the sixteen service designs was then distributed to the respondents to be assessed against the five pairs of Kansei words in the form of a semantic differential 2 questionnaire seen in Table 15.

Table 15. Design In the Questionnaire

Card List						
Card ID	**Body Activity**	**Mind Activity**	**Soul Activity**	**Nutrients**	**Rest Area**	**Cafe**
Design 1	Fun Bike (2)	Biopharmaceutical Education Tour (2)	Herbal Drink Making (2)	Local Food (2)	Inside (1)	Closed (2)
Design 2	Hiking (1)	Fruit Picking Tour 3S (1)	Essential Oil Making (1)	Herbal Drinks (1)	Outside (2)	Closed (2)
Design 3	Hiking (1)	Biopharmaceutical Education Tour (2)	Essential Oil Making (1)	Local Food (2)	Inside (1)	Closed (2)
Design 4	Hiking (1)	Biopharmaceutical Education Tour (2)	Essential Oil Making (1)	Local Food (2)	Outside (2)	Open (1)
Design 5	Hiking (1)	Fruit Picking Tour 3S (1)	Herbal Drink Making (2)	Local Food (2)	Outside (2)	Open (1)
Design 6	Fun Bike (2)	Fruit Picking Tour 3S (1)	Essential Oil Making (1)	Local Food (2)	Inside (1)	Closed (2)
Design 7	Hiking (1)	Fruit Picking Tour 3S (1)	Dagger Crafts & Gamelan (3)	Local Food (2)	Inside (1)	Closed (2)
Design 8	Hiking (1)	Biopharmaceutical Education Tour (2)	Herbal Drink Making (2)	Herbal Drinks (1)	Outside (2)	Closed (2)

		Card List				
Card ID	Body Activity	Mind Activity	Soul Activity	Nutrients	Rest Area	Cafe
Design 9	Fun Bike (2)	Biopharmaceutical Education Tour (2)	Dagger Crafts & Gamelan (3)	Local Food (2)	Outside (2)	Open (1)
Design 10	Fun Bike (2)	Fruit Picking Tour 3S (1)	Dagger Crafts & Gamelan (3)	Herbal Drinks (1)	Outside (2)	Closed (2)
Design 11	Fun Bike (2)	Fruit Picking Tour 3S (1)	Essential Oil Making (1)	Local Food (2)	Outside (2)	Open (1)
Design 12	Fun Bike (2)	Biopharmaceutical Education Tour (2)	Essential Oil Making (1)	Herbal Drinks (1)	Inside (1)	Open (1)
Design 13	Hiking (1)	Biopharmaceutical Education Tour (2)	Dagger Crafts & Gamelan (3)	Herbal Drinks (1)	Inside (1)	Open (1)
Design 14	Fun Bike (2)	Fruit Picking Tour 3S (1)	Herbal Drink Making (2)	Herbal Drinks (1)	Inside (1)	Open (1)
Design 15	Fun Bike (2)	Biopharmaceutical Education Tour (2)	Essential Oil Making (1)	Herbal Drinks (1)	Outside (2)	Closed (2)
Design 16	Hiking (1)	Fruit Picking Tour 3S (1)	Essential Oil Making (1)	Herbal Drinks (1)	Inside (1)	Open (1)

Table 16. Determination Of Items and Categories of Piat Wellness Tourism Service Design

No	Item	No	Category	Notation
1	Body	1	Hiking	X1.1
		2	Cycling/*Fun Bike*	X1.2
2	Thought	1	3S Fruit Picking Tour	X2.1
		2	Educational Tours of Biopharmaceutical Gardens	X2.2
3	Soul	1	Essential Oil Manufacturing	X3.1
		2	Herbal Drink Making	X3.2
		3	Dagger Crafts & Gamelan	X3.3
4	Nutrients	1	Herbal Food & Drinks	X4.1
		2	Local Food & Drinks	X4.2
5	Cafe	1	Inside	X5.1
		2	Outside	X5.2
6	Rest area	1	Open	X6.1
		2	Closed	X6.2

This study uses 162 respondents, where the variable X1 is the body item, X2 is the mind, X3 is the soul, X4 is nutrition, X5 is the café, and X6 is the rest area.

4) Analysis of Quantification Theory Type 1 (QT 1)

The following are the results of QT 1 analysis for 5 pairs of selected Kansei words, namely warm-cool, general-local wisdom, sad-pleasant, independent-with a guide, and quite adequate-good. The data used in this QT 1 analysis is the average value of the service design on each pair of Kansei words, then analyzed using the help of open source software Rstudio using the QT 1 syntax (Aoki, 2009). Table 17 is the result of QT 1 analysis of each Kansei word

Table 17. QT 1 Analysis Results on Each Kansei Word

Item	Category	Warm-Cool		General-Local Wisdom		Somber-Fun		Independence-Availability of a Guide		Sufficient-Good	
		Category Score	PC	Category Score	PC	Category Score	PC	Category Score	PC	Category Score	PC
X1	X11	0.021	0.458	0.040	0.591	0.018	0.480	0.019	0.341	0.041	0.717
	X12	-0.021		-0.040		-0.018		-0.019		-0.041	
X2	X21	0.035	0.647	-0.031	0.497	0.004	0.131	0.019	0.341	0.003	0.062
	X22	-0.035		0.031		-0.004		-0.019		-0.003	
X3	X31	-0.005	0.375	-0.083	0.861	-0.014	0.398	-0.009	0.657	-0.021	0.592
	X32	0.028		0.024		0.013		-0.054		0.050	

Item	Category	Warm-Cool		General-Local Wisdom		Somber-Fun		Independence-Availability of a Guide		Sufficient-Good	
		Category Score	PC	Category Score	PC	Category Score	PC	Category Score	PC	Category Score	PC
	X33	-0.018		0.141		0.016		0.071		-0.008	
X4	X41	-0.024	0.499	0.034	0.526	-0.003	0.094	0.049	0.686	-0.033	0.630
	X42	0.024		-0.034		0.003		-0.049		0.033	
X5	X51	0.020	0.414	0.013	0.223	-0.027	0.630	0.009	0.167	0.016	0.376
	X52	-0.020		-0.013		0.027		-0.009		-0.016	
X6	X61	0.028	0.437	0.048	0.657	0.028	0.647	-0.006	0.120	-0.021	0.469
	X62	-0.028		-0.048		-0.028		0.006		0.021	
R		0.811		0.912		0.809		0.813		0.854	
R-Square		0.658		0.831		0.654		0.662		0.730	
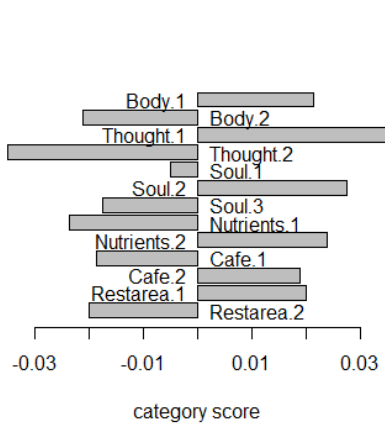
Figure 4. Score Chart for the "Warm-Cool" Word Pair Category
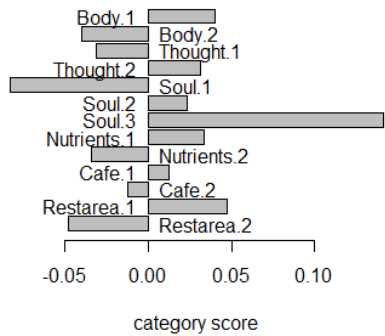
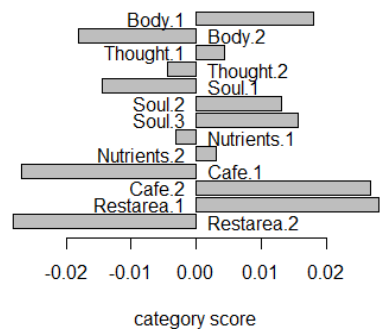Figure 5. Word Pair Category Score Chart "General-Local Wisdom"

Figure 6. Score Chart for the "Somber-Fun" Word Pair Category
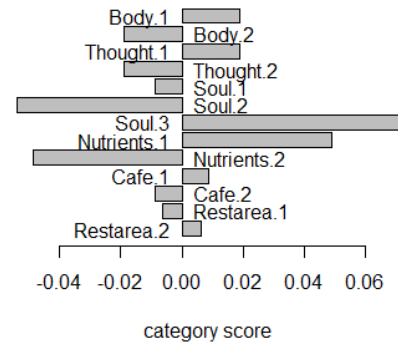

Figure 7. Score Chart for the Word Pair Category "Independence-Availability of a Guide"
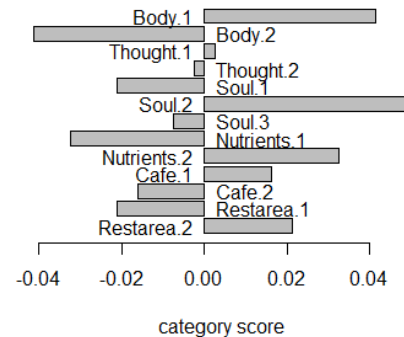

Figure 8. Word Pair Category Score Graph "Quite Adequate -Good"

The results of the Kano model analysis show that the focus of improvement is on the attractive and one-dimensional categories so must-be and indifferent are not the focus of improvement because they do not affect the level of tourist satisfaction in wellness tourism services. The service attributes are quite adequate-good, neat-spread, and shady-worthy, and do not need to be improved.

The Kansei analysis shows that integrating Kansei engineering with the Kano model includes obtaining the service attributes expected by prospective tourists and their contribution to satisfaction decisions and purchasing wellness tourism services. Kansei engineering can identify the emotional desire attributes of potential tourists related to the design elements of wellness tourism services at PIAT which will be offered to the manager for development options.

5) Prototype of Design Selection suitable for PIAT Wellness Tourism

Based on the results of the QT 1 analysis, the specifications of the wellness tourism prototype were obtained by choosing the category score of each attribute level that has the highest positive value. According to Nagamachi (2011), the value of R indicates how well the model is formed between the Kansei word and the technical attribute, if the value of R should be >0.8 which indicates a model that is classified as reliable and feasible. In this study, it was obtained that all models have a correlation of >0.8 which means that all models match the data being studied. So that the prototype of the wellness tourism product has the following product specifications seen in Table 18.

Table 18. Prototype Of Wellness Tour Design Options

Design	X_1	X_2	X_3	X_4	X_5	X_6
	Body	Thought	Soul	Nutrients	Café	Rest Area
Cool	Hiking	3S Fruit Picking Tour	Herbal Drink Making	Local Food & Drinks	Inside	Open
Local Wisdom	Hiking	Educational Tours of Biopharmaceutical Gardens	Dagger Crafts & Gamelan	Herbal Food & Drinks	Inside	Open
Fun	Hiking	3S Fruit Picking Tour	Dagger Crafts & Gamelan	Local Food & Drinks	Outside	Open
Existence Of a Guide	Hiking	3S Fruit Picking Tour	Dagger Crafts & Gamelan	Herbal Food & Drinks	Inside	Closed
Good	Hiking	3S Fruit Picking Tour	Herbal Drink Making	Local Food & Drinks	Inside	Closed

4. Conclusion

1. Based on the results of the Kansei engineering analysis, it shows that nine represent wellness tourism, namely shady, nice, cool, neat, fun, adapted, local wisdom, the presence of a guide, and the latest (update).
2. Then the results of Kansei engineering, the authors recommend to the PIAT manager to choose the development of PIAT towards wellness tourism with 5 service designs in prototype form.
3. Based on the analysis of the Kano model, some attributes can increase tourist satisfaction if applied in development, namely warm-cool, general-local wisdom, sad-fun, independent-the presence of a guide, and quite adequate-good with a satisfaction score of 0.53 between 0.63.

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